

### **REMARKS**

Claims 1-40 are pending. Claims 1, 10, 13, 20, 29, and 32 are amended. No new matter is added as a result of the above amendments. Reconsideration of presently pending claims 1-40 is respectfully requested in light of the above amendments and the following remarks.

#### **Obviousness-type Double Patenting**

The examiner has rejected claims 1-40 under the judicially-created doctrine of obviousness-type double patenting as being unpatentable in view of claims 1-42 of copending Application No. 10/766,596, which was filed January 27, 2004. Applicants have submitted herewith a terminal disclaimer under 37 CFR § 1.321, thus obviating the double patenting rejection. Applicants respectfully request that the rejection be withdrawn.

#### **Rejections Under 35 U.S.C. §103(a), Claims 1-5, 8-10, 15, 20-24, and 27-29**

Claims 1-5, 8-10, 15, 20-24 and 27-29 are rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Yang, et al. (US Patent No. 6,451,647 hereinafter referred to as "Yang") in view of Ying, et al. (US Patent No. 6,436,838 hereinafter referred to as "Ying"). Applicants traverse this rejection on the grounds that these references are defective in establishing a prima facie case of obviousness with respect to claims 1 and 20.

As the PTO recognizes in MPEP § 2142:

*... The examiner bears the initial burden of factually supporting any prima facie conclusion of obviousness. If the examiner does not produce a prima facie case, the applicant is under no obligation to submit evidence of nonobviousness...*

It is submitted that, in the present case, the examiner has not factually supported a prima facie case of obviousness for the following, mutually exclusive, reasons.

**1. Even When Combined, the References Do Not Teach the Claimed Subject Matter**

The Yang and Ying patents cannot be applied to reject claims 1-5, 8-10, 15, 20-24 and 27-29 under 35 U.S.C. § 103(a), which provides that:

*A patent may not be obtained ... if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains ... (Emphasis added)*

Thus, when evaluating a claim for determining obviousness, all limitations of the claim must be evaluated. However, neither Yang nor Ying discloses “etching through exposed portions of said high k dielectric layer with a plasma etch comprised of an inert gas, BCl<sub>3</sub>, and one or more fluorocarbon gases C<sub>x</sub>H<sub>y</sub>F<sub>z</sub>, wherein x and z are integers and y is an integer or is 0, or CH<sub>4</sub>” as recited in claims 1 and 20.

The examiner admits that Yang does not disclose “a plasma etch comprised of an inert gas, BCl<sub>3</sub>, and one or more fluorocarbon gases C<sub>x</sub>H<sub>y</sub>F<sub>z</sub> or CH<sub>4</sub>,” but alleges that Ying discloses the use of barium trichloride gases with other halogens to plasma etch dielectrics at column 3. Applicants respectfully disagree. At column 3, lines 25-55, Ying discloses that “[t]he plasma etchant species are generated from a plasma source (feed) gas comprising boron trichloride (BCl<sub>3</sub>) or silicon tetrachloride (SiCl<sub>4</sub>), or a combination thereof. The BCl<sub>3</sub> or SiCl<sub>4</sub> principal etchants are frequently used in combination with argon, oxygen, nitrogen, chlorine, or a combination thereof. . . . Other essentially inert gases may be added, for example and not by way of limitation, xenon, krypton, or helium.”

Thus, Ying merely discloses a plasma etchant that comprises BCl<sub>3</sub> or SiCl<sub>4</sub> in combination with an inert gas such as argon, oxygen, nitrogen, or chlorine. Ying does not disclose “one or more fluorocarbon gases C<sub>x</sub>H<sub>y</sub>F<sub>z</sub>, wherein x and z are integers and y is an integer or is 0, or CH<sub>4</sub>.” There is no disclosure or suggestion in the reference of carbon,

hydrogen, or fluorine, let alone one or more fluorocarbon gases  $C_xH_yF_z$ , wherein x and z are integers and y is an integer or is 0, or  $CH_4$ .

In addition, the examiner alleges that it would have been obvious to one of ordinary skill in the art to modify the Yang process by the teachings of Ying reference to use barium trichloride in the plasma in order to increase the selectivity of the etchant gases. However, neither Yang nor Ying mentions the use of one or more fluorocarbon gases  $C_xH_yF_z$  or  $CH_4$  in the plasma. One of ordinary skill in the art would not have been led to modify Yang's or Ying's disclosure to include one or more fluorocarbon gases  $C_xH_yF_z$  or  $CH_4$  in a plasma.

Thus, for this mutually exclusive reason, the examiner's burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection under 35 U.S.C. § 103 should be withdrawn.

## **2. The Combination of References is Improper**

Assuming, arguendo, that none of the above arguments for non-obviousness apply (which is clearly not the case based on the above), there is still another, mutually exclusive, and compelling reason why the Yang and Ying patents cannot be applied to reject claims 1-5, 8-10, 15, 20-24 and 27-29 under 35 U.S.C. § 103(a).

§ 2142 of the MPEP also provides:

*...the examiner must step backward in time and into the shoes worn by the hypothetical 'person of ordinary skill in the art' when the invention was unknown and just before it was made.....The examiner must put aside knowledge of the applicant's disclosure, refrain from using hindsight, and consider the subject matter claimed 'as a whole'.*

Here, neither Yang nor Ying discloses, or even suggests, the desirability of the combination since neither reference discloses a plasma etch comprised of an inert gas,  $BCl_3$ , and one or more fluorocarbon gases  $C_xH_yF_z$ , wherein x and z are integers and y is an integer or is 0, or  $CH_4$ , as recited in claims 1 and 20. Yang merely discloses a lower power plasma, but fails to disclose one or more fluorocarbon gases  $C_xH_yF_z$ , wherein x and z are integers and y is an integer

or is 0, or CH<sub>4</sub>. Ying discloses a plasma etchant that comprises merely BCl<sub>3</sub> and inert gas, but fails to disclose one or more fluorocarbon gases C<sub>x</sub>H<sub>y</sub>F<sub>z</sub>, wherein x and z are integers and y is an integer or is 0, or CH<sub>4</sub>.

Thus, it is clear that neither patent provides any incentive or motivation supporting the desirability of the combination. Therefore, there is simply no basis in the art for combining the references to support a 35 U.S.C. § 103(a) rejection. In addition, even, arguendo, if one of ordinary skill in the art were to combine the disclosures of Yang and Ying, the resulting combination still would not be a plasma that comprises one or more fluorocarbon gases C<sub>x</sub>H<sub>y</sub>F<sub>z</sub>, wherein x and z are integers and y is an integer or is 0, or CH<sub>4</sub>, since neither reference mentions the use of one or more fluorocarbon gases C<sub>x</sub>H<sub>y</sub>F<sub>z</sub> or CH<sub>4</sub> in a plasma.

In this context, the MPEP further provides at § 2143.01:

*The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.*

In the above context, the courts have repeatedly held that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination.

In the present case it is clear that the examiner's combination arises solely from hindsight based on the invention without any showing, suggestion, incentive or motivation in either reference for the combination as applied to claims 1 and 20. Therefore, for this mutually exclusive reason, the examiner's burden of factually supporting a *prima facie* case of obviousness has clearly not been met, and the rejection to claims 1-5, 8-10, 15, 20-24 and 27-29 under 35 U.S.C. §103(a) should be withdrawn.

**Conclusion**

It is clear from all of the foregoing that independent claims 1 and 20 are in condition for allowance. Dependent claims 2-19 and 21-40 depend from and further limit independent claims 1 and 20 and therefore are allowable as well.

An early formal notice of allowance of claims 1-40 is requested.

Respectfully submitted,



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Dated: February 27, 2006

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R-122901

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